



Cabin Ridge Project Ltd. – Follow-up Submission to the Coal Policy
Committee

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August 31, 2021

In this submission, addressed will be the following:

- 1) An executive summary of the positions outlined in the presentations *“Coal Reserves and Coal Mine Economics of the Crowsnest Pass”* as submitted by Dr. Langenberg, P. Geol. and *“Crowsnest Coal Reserves, Mistaken Value of AB’s Eastern Slopes Coal Reserves, Metallurgical Coal Quality and Market Value”* as submitted by Mr. Kolijn.
- 2) Provided will be a high-level summary of the quality results collected and determined by Cabin Ridge Project Ltd. (CRPL) and its professional staff and consultants from the 2020 exploration program on the CRPL tenement. Included in the group of professionals undertaking the work for CRPL are those who are categorized as a “Qualified Person”¹, those who are a “Responsible Member”² and some professionals that are in both categories.
- 3) Data and evidence, observations and a counter point of view from published literature contradicting the assertions contained in the presentation provided by Willem Langenberg, PhD., P. Geol. of Long Mountain Research and the University of Alberta entitled *“Coal Reserves and Coal Mine Economics of the Crowsnest Pass”*.
- 4) Data and evidence, observations and a counter point of view from published literature contradicting the assertions contained in the presentation provided by C. Kolijn, *Crowsnest Coal Reserves, Mistaken Value of AB’s Eastern Slopes Coal Reserves, Metallurgical Coal Quality and Market Value, May 25, 2021*.

Executive Summary

In this submission, elements to be addressed include the following:

- 1) Both Dr. Langenberg and Mr. Kolijn provide assertions regarding the overall resource, reserve and quality of coal in the Crowsnest Pass region and sometimes the overall Eastern Slopes of Alberta. Neither of them appears to have direct knowledge respecting several of the mine development properties for which they make these assertions, and the cited evidence is weak or non-existent. The general observations offered by Langenberg and Kolijn regarding potential steel making coal properties in the Crowsnest Pass region of Alberta are contradicted by the actual data collected in 2020 by CRPL for its tenement in the Crowsnest Pass region, and information publicly disclosed by Atrium Coal.
- 2) Both Dr. Langenberg and Mr. Kolijn provide assertions regarding the economics of the potential Crowsnest Pass development properties. However, the most basic measures of project economics are overlooked in both presentations, leaving an informed reader with no way of determining whether the various

¹ Ontario Securities Commission, NI 43-101, Standards for Disclosure of Minerals Projects (2016), Ch. 5 Rules and Policies, p. 3-4.

² APEGA, Professional Practice Standard, Authenticating Professional Work Products, v8.4 (2021), p. 9.

observations offered regarding inferior economics of proposed projects have validity.

The profitability of a steel making coal mine is determined by production scale multiplied by margin (revenue less operating costs).

- Production scale is largely driven by the size of the resource;
- Revenue per tonne is driven by coal quality;
- The key driver of operating costs for an open pit mine is strip ratio.

Accordingly, this submission will provide an evidence based assessment of these metrics. The only conclusion supported by the data is that the Cabin Ridge property would be a profitable and reliable mining operation producing a steel making coal of a high and superior quality as compared to peers throughout the world. It will be shown that the CRPL project:

- Would produce very high quality hard coking coal (which would reduce the emissions intensity of steelmaking)
- Will be highly profitable, on account of its low operating costs and high quality coking coal.

Absent from the Kolijn and Langenberg presentations are several fundamental industry metrics which are used to compare and contrast different properties, and to enable an informed reader to assess project economics. Frequently in each respective presentation, Dr. Langenberg and Mr. Kolijn unfavourably compare the Crowsnest Pass coal resources to those found in southeast British Columbia and operated by Teck. It is accepted in industry that the Teck mines are widely regarded as amongst the world's most valuable steel making coal mines, after those operated by BHP in Australia.

The following Table of fundamental industry cost metrics demonstrate that the projects proposed by Atrum and CRPL offer favourable project economics, even compared against the high benchmark of Teck mines:

Summary	Units	Teck	Atrum	CRPL
Strip Ratio (SR - Bank Cubic Metre of waste (BCMw) removed per tonne of clean coal produced - lower is better)	BCMw/clean tonne	>10 ³	5.2 ⁴	<9.0
Overall Operating Cost to deliver coal to the ship (OPEX - lower is better)	\$/tonne	110-120 ⁵	95 ⁶	105

³ TD Securities Mining Conference, Teck Presentation, Jan 28, 2021, p.91.

⁴ Atrum Coal, Elan Project: Updated Scoping Study (Dec 2020), p.21, www.atrumcoal.com/investors/presentations

⁵ TD Securities Mining Conference, Teck Presentation, Jan 23, 2020, p.45. See p. 45 Footnote 2; calculation adds in cost of capitalized stripping.

⁶ Atrum Coal, Elan Project: Updated Scoping Study (Dec 2020), p.21, www.atrumcoal.com/investors/presentations

Expected Mine Life	Years	>20 ⁷	>20	
Expected Annual Labour Productivity (higher is better)	KTonne/employee	5.5-6 ⁸	12 ⁹	>11

Strip Ratio (SR) is a measure of the amount of rock that is removed to access the coal reserve. SR is a dominant driver of operating costs for surface mines. Given that there is significant cost in removing rock, a lower SR provides considerable economic advantage to a project. As noted above, both of CRPL and Atrum will enjoy a lower SR as compared to Teck. OPEX is a measure of the dollars per tonne required to deliver the coal to a ship at berth. Clearly a lower OPEX is beneficial to project economics. Both of CRPL and Atrum will have a favourable OPEX as compared to Teck. Expected Mine Life is the duration of time over which a mine will be actively producing coal and reflects the resource size, reserve and is a key element in estimating project economics. A critical item in project economics is Average Weighted Haul Distance (AWHD), which is often reported in kilometres (km). This is the distance that a project is required to haul the waste rock from the operating face to the waste storage facility. Given the sensitivity of the data, many companies do not report their operating data to this degree of detail, and it is often difficult to find AWHD information in the public domain. Consequently, a competent Analyst will estimate or back calculate the AWHD from the Labour Productivity information, which is often reported in KTonnes/employee/yr. or Tonnes/Workshift. The point offered is that Strip Ratio, Operating Cost and Labour Productivity are critical elements to address in making any assessments or pronouncements on project economics or viability. It is again observed that neither Dr. Langenberg nor Mr. Kolijn provide any assessments on these most basic of Mine Engineering benchmarks when offering their observations on project economics for properties in the Crowsnest Pass region of Alberta.

The most significant factual errors in the Langenberg and Kolijn presentations are that of assuming that all of the Crowsnest Pass coal production will all be lower quality Hard Coking Coals. As is outlined in detail in this report, in the case of CRPL that assumption is factually incorrect. The consequent assumptions of Langenberg and Kolijn regarding unreliable production and markets for sales (in industry this is referred to as being a “swing” supplier) is therefore also factually incorrect. The high quality of CRPL’s production means that CRPL coal is expected to be a contributor to an increase in Blast Furnace (BF) efficiency, thereby allowing for lower CO₂ emissions per tonne of steel produced by the BF. It does not strain credibility to model that due to public policy on carbon pricing that future demand for steel making coal will in part be driven by CO₂ emissions from the BF occurring during the initial reduction of the iron

⁷ Atrum Coal, Elan Project: Updated Scoping Study (Dec 2020), p. 19, www.atrumcoal.com/investors/presentations

⁸ Initial Project Description: Castle Mountain, Teck Coal Ltd. Fording River Operations, March 2020, p.70, https://www.projects.eao.gov.bc.ca/api/public/document/5ede866ae321f30021a8ed3c/download/CASTLE_IPD_Financial.pdf

⁹ Atrum Coal, Elan Project: Updated Scoping Study (Dec 2020), p.21, www.atrumcoal.com/investors/presentations. Includes estimate of labour count.

ore to steel. Therefore, high quality HCCs, such as is found in the CRPL tenement, will be in great demand in jurisdictions that are not ideal for the alternative steel making technologies mentioned but not detailed in the Langenberg and Kolijn presentations. This logical conclusion and the emissions lowering opportunities that it presents is also not detailed in either the Langenberg or Kolijn presentations.

Neither Dr. Langenberg nor Mr. Kolijn present themselves as a Qualified Person¹⁰ under “*The National Instrument 43-101 Standards for Disclosure of Mineral Projects*”. Assuming that the omission is not an oversight, observations and conclusions offered by either individual respecting Reserves, Resources and coal quality of any geological occurrence ought to be viewed with the understanding that they both lack that high level of expertise in this particular area of practice.

In conclusion, the assessments offered by Dr. Langenberg and Mr. Kolijn regarding project economics of steel making coal development in the Crowsnest Pass area of Alberta are variously incomplete, factually flawed or factually incorrect. Consequently, the presentations offered by Dr. Langenberg and Mr. Kolijn ought to be ignored.

Cabin Ridge Project Limited (CRPL) Drilling Exploration Results

Upon approval of its coal exploration permit in September 2020, CRPL undertook drilling on its tenement north of Coleman Alberta during the months of October and November 2020. Approximately 75 holes totalling 15,500 m were drilled on the property, complementing historical drilling campaigns. Several core holes were drilled specifically for the purpose of acquiring coal quality data for the project. Results obtained indicate a world class large scale, low strip ratio Hard Coking Coal (HCC) resource that would clearly underpin a highly valuable Tier 1 HCC mine providing premium quality coking coal for steelmaking customers.

The following table provides a summary of CRPL coal quality results acquired during the 2020 field campaign, for Atrum Coal on a property in the vicinity of CRPL in the Crowsnest Pass area of the Eastern Slopes and also outlines what is accepted in industry throughout the world as appropriate HCC quality standards. Highlights of the material coal quality information are as follows:

¹⁰ Ontario Securities Commission, NI 43-101, Standards for Disclosure of Minerals Projects (2016), Ch. 5 Rules and Policies, p. 3-4.

Item	Units	CRPL Results	Atrum Elan Results ¹¹	MCC1 Aus. Low vol HCC ¹²	MCC2 Aus. Mid vol HCC ¹³
Clean Coal Ash (adb ¹⁴) (Plant Yield)	(%)	8-9 (65-68)	8-9 (60)	<11	<11
Volatile Matter (adb)	(%)	20-24	22-26	21.5 Max	21.5 - 25
Phosphorous (adb)	(%)	0.010-0.120	<0.050	0.050	<0.040
Coke Strength after Reaction (CSR)		>73 ¹⁵	69-71	>70	>67
Fluidity	Dial divisions per minute (ddpm)	7-1700	100-300	180 Max	1000 Max
Expected Realization of Benchmark Price	(%)	95-100			

It can only be concluded that the drilling results for CRPL and Atrum unequivocally demonstrate the presence of Prime Hard Coking Coal within the respective tenements. Indeed, this would be amongst the very highest quality coking coal available to steelmakers globally.

It is generally accepted in the steel making industry that probably the most significant test result that determines the quality of an HCC is Coke Strength after Reaction (CSR). This test was created by the Japanese steel industry in the 1970's and has gained acceptance around the world for the purpose of grading and rating HCC. Results determined for CRPL coals were amongst the highest known CSR results achieved in Western Canada and would be equal or superior to competitor coals from around the world.

An important marker for any HCC project is the expected realization of the Aus. Benchmark pricing. This is a critical element in making any pronouncements regarding project economics. Given the data results obtained by CRPL, current estimate for realization of benchmark price would be at least 95%. This expected result is similar to that achieved by Teck in the international marketplace and is an indicator of high quality HCC.

Respecting CRPL, the general observations offered by Dr. Langenberg and Mr. Kolijn that steel making coals in the Crowsnest Pass area are of poor quality and are inferior to steel making coals found in the Elk Valley of British Columbia are factually incorrect.

¹¹ Atrum Coal, Elan Project: Updated Scoping Study (Dec 2020), p.9, www.atrumcoal.com/investors/presentations

¹² IHS Markit, Coking Coal Marker Price, Methodology and Specifications, Effective Feb 2021, p.11

¹³ Ibid, p.12.

¹⁴ Air Dried Basis is shortened to adb and is a measuring and reporting designation commonly used in industry.

¹⁵ During the CRPL program, 9 datapoints were collected. Utilizing Canadian and German facilities, CRPL samples submitted resulted in outstanding results with the lowest CSR determined at 73.3.

Coal Reserves and Coal Mine Economics of the Crowsnest Pass – Dr. Langenberg

Geography

On pg. 1 the term “Crowsnest Pass coal reserves” is used and the presentation goes on to reference Benga’s Grassy Mountain mine, Montem Resources Tent Mountain mine, Chinook Vicary, Chinook South and Atrum Coal all of which are in the Crowsnest Pass area. In the Conclusion section, Dr. Langenberg makes the statement “Mining metallurgical coal in Alberta’s Eastern Slopes is considered uneconomic”, but it is noted that he does not outline who is carrying out the consideration, and it is offered that there have historically been profitable operating coal mines within the Eastern Slopes of Alberta.

While the presentation itself addresses the area of the Crowsnest Pass, without attribution the conclusion section broadens the assessment to include the entire Eastern Slopes area of Alberta, and it ought to be considered that that broadening action is flawed. To be consistent with the topic that the presentation addresses (as evidenced by the title itself), it is recommended that the reference to the Eastern Slopes be ignored and that a reader confine a review of the presentation to that of the Crowsnest Pass region.

Reserves and Resources

The alternating references between “Resource” and “Reserve” within the presentation is confusing. For the sake of clarity, the following definitions are offered ¹⁶:

Mineral Resources are sub-divided, in order of increasing geological confidence, into inferred, indicated and measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.

A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction...

Mineral Reserves are sub-divided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve.

A Mineral Reserve is the economically mineable part of a measured and/or Indicated Mineral Resource. ... and is defined by studies at pre-feasibility or feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified...

¹⁶ CIM Standing Committee on Reserve Definitions (2014): CIM Definition Standards for Mineral Resources and Mineral Standards, CIM, pp 4-7.

The point in highlighting these definitions is that there are varying levels of geological and engineering confidence associated with each of these categories. To a large degree, geological investigations determine the level of confidence of a mineral resource, with a mineral reserve determined by further geological and engineering assessment. Dr. Langenberg makes several observations on coal resources and reserves, and concludes with the point “Thus, the Crowsnest Pass coal reserves are much smaller than those in the Elk Valley.” This statement is misleading as Dr. Langenberg omits a significant explanation for that point. As Dr. Langenberg points out, in the Elk Valley there have been 4 mines in operation for a period of almost 50 years with no comparative in SW Alberta or the Crowsnest Pass. Naturally over that period engineers and geologists have had greater opportunity to delineate and define resources and reserves in British Columbia than has been available for that same level of activity to take place in the Crowsnest Pass and in SW Alberta. That ought not to be viewed as a status representing quantity or quality of the reserve, but rather as a status representing the amount of detailed geological and engineering study that has taken place to date within the region. Nothing about the categories “Resource” or “Reserve” ought to be read in a spirit that disparages the term or reference, but one that recognizes the term as one that refers to degrees of knowledge and certainty.

In the Reserves section of his report, Dr. Langenberg makes the statement the “total reserve in the Crowsnest Pass is 209 million tonnes of coal, of which half is an indicated resource. This is a good indication that the reserve amount is inaccurate, and consequently more exploration will be needed to determine an accurate reserve.”

The National Instrument 43-101 Standards for Disclosure of Mineral Projects (NI 43-101) outlines in detail the requirements for outlining mineral resources and reserves. For entities reporting under the Australian jurisdiction, the equivalent standard is the *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code)*, and the organization that governs consistency and equivalency between these Canadian and Australian organizations is the Committee for Mineral Reserves International Reporting Standards (CRIRSCO). The NI 43-101 standard states that “a technical report must be prepared by or under the supervision of one of more qualified persons.”¹⁷ The standard also defines the term “qualified person”¹⁸ as someone who has the following credentials:

- “is an engineer or geoscientist with a university degree...
- ...in an area of geoscience or engineering relating to mineral exploration or mining...
- ...has experience related to the subject matter of the mineral project...
- ...is in good standing with a professional association...
- ...requires attainment of a position of responsibility in their profession that requires the exercise of independent judgment...”¹⁹

¹⁷ Ontario Securities Commission, NI 43-101, Standards for Disclosure of Minerals Projects (2016), Ch. 5 Rules and Policies, p. 14.

¹⁸ Ibid, p. 3-4.

¹⁹ Ibid, p. 3-4.

When viewed by a Mining Engineer or Geologist who is either familiar with or is a qualified person under NI 43-101, the statement from Dr. Langenberg's presentation that "the reserve amount is inaccurate" would cause concern for that professional. As noted above, there is uncertainty when a qualified person undertakes delineating either a Reserve or Resource, but it is misleading to state that reserve amounts are "inaccurate", and a member of the public would be confused and not understand the significance of what is being offered by Dr. Langenberg. Indeed, the statement is the equivalent of saying that a Qualified Person is misleading the public and investors as to the amount of resource or reserve at a property and is a serious allegation to make in a casual or offhanded way. At the very least, sufficient qualifiers or elaborations are not attached to this statement to provide the proper context for members of the public, and the statement ought to be withdrawn.

Coal Quality

In the section entitled Coal Quality, Dr. Langenberg makes the following statement, "The coal quality of the Montem project in the Tent Mountain area and of the Atrum project in the Chinook Vicary and Chinook South areas appear to be mostly Tier-2 coking coal or even less in quality. However, more exploration is required before an accurate estimate on the coal quality can be given." In this section where he addresses coal quality, Dr. Langenberg cites Kolijn (2021) as his reference. However, in the Kolijn presentation only a cursory assessment appears to be offered regarding the coal quality of the Montem Tent Mountain project, and Dr. Langenberg is offering conclusions respecting facts not evident. Finally, as a reading of Dr. Langenberg's statement above could cause confusion, for the sake of clarity for the readers, the Chinook Vicary and South properties are Montem Resources projects and not Atrum projects.

Economics

In the section entitled Economics, Dr. Langenberg offers several observations regarding the viability of the Grassy Mountain project. Confusing to a reader is the fact that Dr. Langenberg moves back and forth between offering observations on the financial viability of Grassy Mountain, offering conclusions on the macroeconomic potential or status of Alberta coal production and coking coal demand, speaking to the low quality of the steel making coal in Alberta, then offering very specific observations regarding when Grassy Mountain might be expected to enter bankruptcy protection.

As noted above, and at least in the case of CRPL, Dr. Langenberg's observations on inferior HCC coal quality in Alberta are factually incorrect. Furthermore, Dr. Langenberg offers no data or assessments in the area of project economics that an experienced reader would expect to see in order to arrive at informed conclusions regarding project viability, with the following absences highlighted:

- No estimate that addressed project or industry Internal Rate of Return (IRR) %.
- No estimate that addressed project or industry Net Present Value (NPV).
- No observations or assessment on long term coal price.

- No assessment of long-term supply/demand balance, of expected production world-wide, or what constitutes the zone of balance in the coal supply/demand dynamic.
- For expenses, price of important inputs such as power, diesel, labour are not mentioned.
- No financial model, business valuation, or credit worthiness assessment of the project proponent is included to support the prediction the company will be forced to seek creditor protection.
- Most importantly, no estimate of expected margin for the project, listed in \$/tonne. This is a critical number that would allow Dr. Langenberg to make conclusions regarding project viability, or even when the project might enter bankruptcy protection.

In the Economics section, Dr. Langenberg makes the following observation “Coal pricing on the international market is highly volatile and markets for Crowsnest Pass coal might disappear. **Due to its low quality**, it might be among the first jurisdictions to become uneconomic.” In the Executive Summary section, the following observation is offered “The Crowsnest Pass coal reserves are smaller than those in the Elk Valley in BC and **the quality is less suited for steel making than the Elk Valley coals.**” (Note that the highlights are offered for emphasis only and do not appear in the original text). Therefore, a key element within Dr. Langenberg’s presentation is the notion that the Alberta steel making coal resource has a quality that is inferior to that which is located in BC. The supporting evidence that Dr. Langenberg cites for this conclusion is included in the Kolijn (2021) submission to the Coal Consultation Committee. As outlined in the section “Cabin Ridge Project Limited Drilling Exploration Results”, respecting CRPL the conclusion presented by Dr. Langenberg is factually incorrect. Additionally, the Kolijn (2021) presentation references the quality data specific to the Grassy Mountain project and does not adequately or thoroughly address quality data of any other coal property within the Crowsnest Pass region.

Consulting the work published by Smith Cameron and Bustin (1994) “*Coal Resources of the Western Canada Sedimentary Basin*” provides useful information regarding the steel coal resources within SW Alberta and BC. Smith et al. provide several useful references regarding the Western Canada Sedimentary Basin in general and in particular the Mist Mountain formation within SW Alberta and SE British Columbia including:

- “Post-depositional tectonic and thermal history of the basin, mineralization within the fractures and pores of coal beds, and oxidation have modified the composition and properties of the coals”²⁰.

²⁰ Smith, G.G., Cameron A.R., Bustin R.M. (1994): Coal Resources of the Western Canada Sedimentary Basin: in Geological Atlas of the Western Canada Sedimentary Basin, G.D. Mossop and I. Shetsen (comp.), Canadian Society of Petroleum Geologists and Alberta Research Council, URL <https://ags.aer.ca/atlas-the-western-canada->

- “the Jurassic-Cretaceous Mist Mountain Formation, which contains the major coal deposits within the Front Ranges of southeastern British Columbia and southwestern Alberta...
- ...Economically important coal seams occur throughout the succession”²¹.
- “Extensive shearing and structural thickening and thinning of coal beds in the cores of flexures are common in highly deformed regions. Deformation has resulted, in many instances, in the destruction of the primary depositional fabric of coal beds”²².
- “Coals in the Mist Mountain Formation vary in rank mainly between medium and low volatile bituminous (Fig. 33.10a), and generally yield firm, coherent coke”²³.

The various points that the authors make can be summed up as follows: the Mist Mountain formation contains coal that can produce coherent coke and that localized geological activity has occurred that can impact coal quality. No mention in the paper can be found differentiating the coal qualities of the coal beds between British Columbia and Alberta.

The paper published in 1989 by Hughes, Klatzel-Mudry and Nikols “*A Standardized Coal Resource/Reserve Reporting System for Canada*” provides a worthwhile insight into the types of geological complexities of coal occurrences in Canada ranking from Low to Severe. Respecting the Severe category, Hughes et al offer the following:

- “Deposits in this category have been subjected to extreme levels of tectonic deformation...
- ...The Byron Creek deposit of southeastern British Columbia, and parts of the Grassy Mountain deposit of southwestern Alberta are examples of severe category deposits”²⁴.

While the paper and reserve system have been updated since 1989, what is of interest are the comments offered by Hughes et al respecting tectonic activity and the two particular properties noted. The examples offered for severe coal occurrences occur on both sides of the border and do include parts of Grassy Mountain. Combined with the insight offered by Smith et al regarding deformation impacting coal quality, it can be concluded that these events occurred at different locations within the Mist Mountain Formation, and are independent of which side of the border upon which a property resides. More importantly, if a reviewer assesses parts of Grassy Mountain coal quality and extrapolates those results to either the Crowsnest Pass region or the entire Eastern Slopes region, as it appears that Dr. Langenberg and Mr. Kolijn have done, then an unrepresentative and misleading picture can be arrived at

[sedimentary-basin/chapter-33-coal resources of the western canada sedimentary basin](#), [July 22, 2021 accessed online]. P. 471

²¹ Ibid p.473

²² Ibid p.475

²³ Ibid p. 476

²⁴ Hughes, J.D., Klatzel-Mudry L., Nikols D.J. (1989): *A Standardized Coal Resource/Reserve Reporting System for Canada*, Geological Survey of Canada Paper 88-21, Energy Mines and Resources Canada, p.5.

regarding Crowsnest Pass regional coal quality. For that reason, the conclusions offered by Dr. Langenberg regarding southwest Alberta coal quality contained in the statement “The Crowsnest Pass coal reserves are smaller than those in the Elk Valley in BC and the quality is less suited for steel making than the Elk Valley coals” ought to be discounted.

Various

In his presentation Dr. Langenberg offers various observations on tourism, recreation, renewable energy, water supply, irrigation (presumably for agriculture) and the potential for a compromised water supply from coal mining for all southern Alberta, Saskatchewan and Manitoba. Given that Dr. Langenberg presents himself as a professional engaged in “Independent Geological Research”, his observations on any and all of these areas ought to be ignored.

Crowsnest Coal Reserves, Mistaken Value of AB’s Eastern Slopes Coal Reserves – Mr. Kolijn

The first observation regarding the submission of Mr. Kolijn is respecting the assertion “The mines (Crowsnest Pass mines) shut down due to inadequate quality and low market value of their Metallurgical Coal”. Contrary to a minimum logical obligation, it is noted that Mr. Kolijn is asserting facts not evident in his presentation, and he is therefore presenting as a conclusion something that is unsupported by his cited evidence.

In the graph included in p.9 of his presentation, Mr. Kolijn asserts that the Coke Strength after Reaction (CSR) range for prime Hard Coking Coals is 68-71. As indicated earlier, to capture the Cabin Ridge Project Limited coal qualities on his graph, Mr. Kolijn will be obliged to increase the range of his Y axis to include a scale up to and beyond 80 CSR to accommodate the higher CSR results obtained by CRPL through independent laboratories.

In the graph included in p.10 of his presentation, Mr. Kolijn asserts that the Fluidity range for Elk Valley Pime (sic) Hard Coking Coals is 200-400 ddpm. A search of published papers in this area indicates an inconsistency or discrepancy in Mr. Kolijn’s assertion with those of published results. In her paper “*Evaluation of coal ash chemistry indices for predicting CSR (coke strength after reaction with CO₂) for coking coals of the Rocky Mountains, BC*”, Riddell offers observations on CSR versus coal fluidity. In Figure 16 of her paper “CSR vs fluidity”²⁵, Riddell graphs the relationship between the two, and it is noteworthy that there are included in the data a range of CSRs from 40 – 80 for British Columbia coals that all have an identical fluidity of approximately 50 ddpm which is far below the Fluidity range cited by Mr. Kolijn for those very coals. Riddell goes on to say “Samples with very low fluidities of under 200 dial diameters per minute (ddpm) produced cokes with good CSRs”²⁶. CSR is a key and critical test in determining the value of a HCC in the marketplace, and as presented Mr. Kolijn’s graph will undermine and

²⁵ Riddell J. (2020): Evaluation of coal ash chemistry indices for predicting CSR (coke strength after reaction with CO₂) for coking coals of the Rocky Mountains, British Columbia, British Columbia Ministry of Energy, Mines and Petroleum Resources British Columbia Geological Survey Geofile 2020-06, p.16.

²⁶ Ibid, p.16

obfuscate the economic value of Alberta and British Columbia HCCs, and Mr. Kolijn's graph therefore ought to be ignored.

Mr. Kolijn has inadvertently moved into the space of commercial discussions that take place between the coal suppliers and purchasers. His assertion on acceptable fluidity ranges is one that Canadian suppliers have heard often during negotiations with steel mills over the past 40-50 years. The fact that many southeastern British Columbia coals are understood to be prime HCCs, even with low fluidities, demonstrates that Mr. Kolijn's assessment regarding Fluidity, at least for Western Canadian Hard Coking Coal is factually incorrect.

Finally, turning back to p.2 of his submission titled "EXECUTIVE SUMMARY – Crowsnest and Eastern Slopes Coal Reserves", Mr. Kolijn offers the following observation "Available coal quality data indicates the coal's quality and market value to be well below that of BC's Elk Valley's (sic) coals". As noted, earlier, pertaining to the CRPL property, that assertion presented by Mr. Kolijn is factually incorrect. Additionally, and without attribution, Mr. Kolijn extends his assertions from the Crowsnest Pass area into the entire Eastern Slopes Coal Reserves, and that extension ought to be ignored.